REMARKS

This Amendment is submitted in response to the Office Action mailed 01 September 2006 and is accompanied by a Petition for Extension of time to extend the due date to 01 February 2007. A Petition for a Two-month Extension of Time is hereby requested and attached under separate cover.

Claims 15-20, 22-25, 27 and 37 are allowed. Claims 2-4 have been rejected and claims 5-10 have been objected to. Claim 1, 11-14, 21, 26, 28-36 and 38-43 were previously cancelled. Claims 2, 4, 5, and 6 have been amended and new claims 44 and 45 have been added. Claims 2-10, 15-20, 22-25, 27, 37, 44 and 45 are pending in the application after entry of this amendment. Reconsideration and withdrawal of the rejections set forth in the Office Action dated 01 September 2006 are respectfully requested.

I. Rejections under 35 U.S.C. §103(a)

Claim 2

Examiner's Rejection

The Examiner has rejected claims 2-4 under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al. (WO 00/14921) in view of Jones et al. (US 6,128,351).

With regard claim 2, the examiner suggests that Calderbank et al. discloses a method of transmitting a signal of the type comprising a sequence of symbols (Fig. 1, element 13 and 14) over spaced antennas (Fig. 1 element 11 and 12) comprising the steps of:

dividing a transmission frame into first and second blocks (page 7, lines 13-14);

processing the sequence of symbols to generate first, second, third, and fourth symbol sequences (Fig. 2 element 13, C1, C2, C_1^* and $-C_2^*$) so that some of the symbols in at least one of the symbol sequences are complex conjugated (Fig. 2 element 13, C_1^*), and some of the symbols in at least one of the symbol sequences are negated and (Fig. 2 element 13, $-C_2^*$), the third symbol sequence (Fig. 2 element 13, C_1^*) corresponding to the first symbol sequence and the fourth symbol sequence corresponding to the second symbol sequence (Fig. 2 element 13, $-C_2^*$), and;

during the first block of the transmission frame, applying the first symbol sequence to a first antenna (page 7, lines 14-17) and the second symbol sequence to a second antenna (page 7, lines 17-18) and during the second block of the transmission frame (page 7, line 18) applying the fourth

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symbol sequence to the first antenna (page 7, lines 19-20) and the third symbol sequence to the second antenna (page 7, lines 18-19).

The examiner therefore suggests that Calderbank et al. discloses all of the subject matter as described in the above paragraph <u>except</u> for specifically teaching "*some of the symbols in at least one of the symbol sequences are time-reversed*".

The examiner further suggests, however, that Jones et al. teaches that some of the symbols in at least one of the symbol sequences are time-reversed (Fig. 4 elements 68-70, column 1 lines 52-57, column 2 lines 17-21 and column 4 lines 48-53).

The examiner goes on to suggest that Jones et al. further teaches that the use of the matched filter characteristics (time-reversed) is that large peak envelope powers (PEPs) are unmatched by the matched filters 68-70, whereas the intervening, relatively small signal perturbations are matched and therefore enhanced (in terms of amplitude) so that it provides a significant performance advantage over existing multicarrier systems, with simulated results showing an improvement in the range of 3 dB and greater (column 4 line 66 -column 5 line 6). In light of these suggestions, the examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Jones et al. in which some of the symbols in at least one of the symbol sequences are time-reversed, into Calderbanks' develop block code generation circuit so as to improve the performance as described in the above paragraph.

Applicant's Response

Without admitting to the propriety of the rejection, and reserving without prejudice the right to resubmit a version of the claim as it existed prior to amendment here, Applicant has amended Claim 2 to recite further specificity relative to relationships or correspondence between the first and third symbol sequence and the second and fourth symbol sequence. Applicant also submits that there is no suggestion or motivation to combine Calderbanks with Jones within either of the references.

With respect to the amendments, Claim 2 now requires "*that processing of the first symbol sequence comprises time reversing and complex conjugating the first symbol sequence to generate the third symbol sequence, and processing of the second symbol sequence comprises time reversing, complex conjugating and negating the second symbol sequence to generate the fourth symbol sequence*". This limitation is analogous to the limitation included in allowable claim 5,

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and Applicant trusts that amended Claim 2 being distinguished from the cited prior art will be allowable on at least the same basis.

Claim 3

Examiner's Rejection

With regard claim 3, Calderbank et al. further discloses wherein processing the sequence of symbols comprises dividing the sequence of symbols to obtain the first and the second symbol sequences (page 7, lines 13-14, where first symbol sequence is C_1 and the second symbols sequence is C_2), processing the first symbol sequence to obtain the third symbol sequence (Fig. 2 element 13, C_1^* and page 7, lines 19-20), and processing the second symbol sequence to obtain the fourth symbol sequence (Fig. 2 element 13, $-C_2^*$ and page 7, lines 18-19).

Applicant's Response

Without admitting to the propriety of the rejection, Applicant has amended Claim 2 distinguish over the prior art. Claim 3 is dependent from claim 2 and allowable over the cited prior art at least on that basis. Applicant again submits that there is no suggestion or motivation to combine Calderbanks with Jones within either of the references. One these bases, Applicant trusts that the rejection of Claim 3 will be withdrawn.

Claim 4

Examiner's Rejection

With regard claim 4, directed to a transmitter. The examiner suggests that Jones et al. further teaches the operational control of the multicarrier transmitter is performed by a microprocessor (not shown), as will be readily understood. The examiner also suggests that one skilled in the art will appreciate that the inverse FFT function would typically be implemented within an Application Specific Integrated Circuit (ASIC) containing a microprocessor engine (column 4 tines 32-38) and that one skilled in the art would have clearly recognized that the processor as taught by Jones et al. would perform same function of the discrete hardware for less expense, adaptability, and flexibility. The examiner then concludes that it would have been obvious to have used the processor for implementing "the claim 1 method as described in the above paragraph" as taught by Jones et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

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Applicant's Response

Without admitting to the propriety of the rejection, and reserving without prejudice the right to resubmit a version of the claim as it existed prior to amendment here, Applicant has amended Claim 4 to recite further specificity relative to relationships or correspondence between the first and third symbol sequence and the second and fourth symbol sequence. Applicant again submits that there is no suggestion or motivation to combine Calderbanks with Jones within either of the references. With respect to the proposed amendments, amended Claim 4 now requires "*processing of the first symbol sequence comprises time reversing and complex conjugating the first symbol sequence to generate the third symbol sequence, and processing of the second symbol sequence comprises time reversing, complex conjugating and negating the second symbol sequence to generate the fourth symbol sequence*". This limitation is analogous to the limitation included in allowable claim 5, and Applicant trusts that amended Claim 4 being distinguished from the cited prior art will be allowable on at least the same basis.

Claims 5-10

Claims 5-10 are objected to as being dependent upon a rejected base claim. The examiner indicates that they would be allowable if rewritten to overcome the objection(s) set forth in the Office Action and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant has separately amended claims 5 and 6 (which were dependent from Claim 3 through Claim 2) to incorporate all of the claim limitations in claims 2 and 3, and trusts that they are in condition for allowance. Claims 7-10 are dependent from claim 6, now in independent form, and also in condition for allowance without further amendment.

Added Independent Claims 44-45

Claims 44 and 45 have been added and are transmitter claims based on amended versions of independent claim 4. Each of claims 44 and 45 include the features of claim 4 prior to amendment herein and separately add limitations that are analogous to the limitations in allowable method of transmitting claims 5 and 6. For example, claim 44 requires a processor ... "*(ii) to divide the sequence of symbols to obtain the first and the second symbol sequences, and for processing the first symbol sequence to obtain the third symbol sequence, and for processing the second symbol sequence to obtain the fourth symbol sequence; and (iii) for processing the second symbol sequence including time reversing, complex conjugating and negating the second symbol sequence to generate the fourth symbol sequence, and for processing the first symbol sequence*

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including time reversing and complex conjugating the first symbol sequence to generate the third symbol sequence;". Similarly, Claim 45 requires a processor ... *"(ii) to divide the sequence of symbols to obtain the first and the second symbol sequences, and for processing the first symbol sequence to obtain the third symbol sequence, and for processing the second symbol sequence to obtain the fourth symbol sequence; and the dividing of the sequence of symbols further includes assigning symbols to the first symbol sequence and to_the second symbol sequence such that there is an equal amount of symbols in each of the first and second symbol sequences and that correlation between symbols close to each other in each of the first and second symbol sequences is not significantly effected;"*.

Applicant submits that the cited art fails to disclose, teach or suggest a transmitter having the recited combination of features recited in these claims and requests allowance of same.
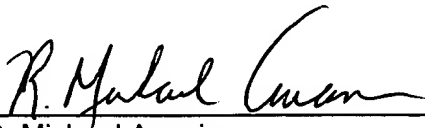
CONCLUSION

In view of the foregoing, Applicants submit that the claims pending in the application patentably define over the prior art.

If in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (650) 838-4367.

The Commissioner is authorized to charge any additional required fees, including fees for additional claims or for any Petition for Extension of Time that may be required to maintain the pendency of this application, or credit any over payment of this paper to Deposit Account No. 50-2207.

Respectfully submitted,
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